REMARKS

A Final Rejection was mailed in the present case on December 31, 2002, making a response due by March 31, 2002. This Preliminary Amendment accompanies a Request For Filing A Continued Prosecution Application and the required filing fee. Since this response is being timely filed, no additional fee is thought to be due at this time. If any additional fee is due for the continued prosecution of this application, please charge the same to Applicant's Deposit Account No. 50-2555 (Whitaker, Chalk, Swindle & Sawyer, LLP).

As explained in the Specification as originally filed, the instant invention is directed to improvements in sealing systems for plastic pipe and notably for polyethylene pipe systems. In the Rieber system commonly found in the industry, a sealing gasket is installed within the bell end of a plastic pipe during manufacture by heating the plastic pipe end and forcing the softened pipe end over a steel mandrel which has a sealing gasket carried thereon. The presence of the sealing gasket on the exterior of the mandrel in a sense forms the gasket receiving groove in the bell end of the pipe as the softened pipe end is cooled and retracts about the gasket and mandrel. Once the pipe end has cooled, the mandrel is withdrawn, leaving the gasket in place within the internal gasket receiving groove. The provision of an "integral" gasket has several advantages including the fact that such gaskets are less likely to be twisted or dislodged as the female or bell section is joined to a male, or spigot pipe section to make up a pipe joint. The tendency is for the gasket to be turned or twisted or to be dislodged from the gasket receiving groove where non-integral, post manufacture sealing gaskets are employed.

The provision of a prestressed and anchored elastomeric gasket during the belling process at the pipe factory thus provides an improved bell or socket end for a pipe joint with a sealing gasket which will not twist or flip or otherwise allow impurities to enter the sealing zones of the joint. However, as has been explained, the Rieber system required that the female preformed pipe end be heated and the pipe end physically forced over the mandrel which held the gasket. Thus, it was necessary to force the pipe end over the gasket and mandrel and to move the pipe end longitudinally over the gasket so that the gasket was seated. This could only be accomplished by heating the thermoplastic material to allow its expansion, followed by cooling to return the material to its natural, relaxed state.

While a number of polyolefin materials can be used in the above described Rieber-type process, polyethylene was not easily utilized. A problem was encountered with polyethylene pipe due to the pipe's tendency to return to its original shape after heating. Thus, after a bell connection is formed using the traditional Rieber techniques of heating, forming/expanding and cooling, the end result is a pipe shape that is not stable. This is why polyethylene pipe is normally joined by electro-welding techniques. Applicant's presently claimed invention uses a different technique of extruding polyethylene strips which are would about the steel forming mandrel and pre-located sealing gasket. The result is a very stable pipe shape which is not affected by subsequent heat and which, at the same time, allows a pipe joint to be easily made up by simply inserting the male spigot end into the previously formed female bell end connection. The method of the invention provides an integral gasket within the socket end of a polyethylene pipe which is securely retained within a receiving groove which is integrally formed about the gasket during the manufacturing step. The manufacturing technique of the invention is especially well adapted for the manufacture of large diameter gasketed pipe at a lower cost that traditional methods.

The Examiner pointed out several informalities in Applicant's claim language which have been addressed in the amendments hereto. The lack of antecedent basis has been addressed in the claim amendments.

The Examiner also continued the substantive rejection of Applicant's remaining claims under 35 U.S.C. Section 103 (a) as being obvious over Sznopek (4,329,193) in view of Sundqvist et al. (5,411,619), further adding the reference to Corbett, Jr. (5, 988, 695) for a teaching of the use of polyethylene gaskets. Sznopek is cited to show the steps of installing an elastomeric gasket on a mandrel and extruding a composite material including a thermosetting plastic. Since the composite material of Sznopek is not a thermoplastic material, the Examiner then cites Sundqvist to show the extrusion of a thermoplastic profile.

Applicant has amended each of the remaining claims in the case in an attempt to better define the particular problem being addressed and to more explicitly point out the novel features of the claimed invention. The preamble of the independent claims now describe "a method of installing an integral sealing gasket within a gasket receiving groove located in a bell connection of a joint of polyethylene pipe." The result of the steps of the manufacturing method result in the formation of "a pre-stressed and pre-located integral gasket" which is "provided within the bell connection which is securely retained within the gasket receiving groove, the bell connection being integrally formed about the gasket during manufacture." The amended language is intended to make clear that

the problem being addressed is that of installing an integral, i.e., Rieber style, gasket within the end of a polyethylene pipe which solves the problems associated with the prior art in such situations. Applicant's gasket is pre-located because it is already present in the gasket receiving groove when the bell pipe end is formed. It can also be pre-stressed, as by stretching the gasket about the forming mandrel before extruding the polyethylene material about the mandrel. All of these factors provide a gasket sealing system which achieves the same objectives as the previous Rieber process, but without the disadvantage of having to stretch a preformed polyethylene pipe end over a forming mandrel.

Sznopek shows the use of a rubber sleeve in interconnecting sections of essentially rigid asbestos-cement pipe (Col. 1, lines12-13). As such, he is not concerned with the expansion and contraction characteristics of polyethylene pipe. He is not concerned with polyethylene plastic pipe joining systems of the type being dealt with in Applicant's invention. In Sznopek, the thermoplastic material is provided in the form of an elastomeric sleeve 12 which is surrounded by a fiber glass plastic body 10. The elastomeric sleeve 12 is cut from a continuous extrusion of EPDM rubber (Col. 5, lines 44-46). The cut section of extrusion is spliced to an annular configuration (Col.5, line 48). The spliced liner is then installed on a rotatable mold (Col. 6, lines 23-24). A polyester body is then built up upon the elastomeric liner (see Col. 7, lines 19-25). Sznopek is not dealing with Applicant's problem of adapting a Rieber type sealing gasket to the bell end connection of a polyethylene pipe. As such, one skilled in the art would not find the answer to Applicant's problem in the teaching of Sznopek.

The Sundqvist reference does deal with spirally wrapping thermoplastic materials, but the pipe joint which is formed does not have an integral gasket which is provided within the socket end of a polyethylene pipe which is securely retained within a receiving groove which is integrally formed about the gasket during the manufacturing step, as claimed by Applicant. Once again, the teaching of Sundqvist is not directed toward an alternative to the Rieber pre-formed and pre-stressed sealing gasket system. The melt thermoplast in Sundqvist is extruded and spirally wrapped in overlapping layers around the mandrel and the pipe end (Abstract of Sundqvist). Applicant is not wrapping a thermoplast melt about a pipe end. Applicant is, more precisely stated, forming a pipe end.

Sznopek stretches a rubber sleeve about a mandrel. A polyester body is then built up upon the sleeve by rotating the mandrel while a polyester hardener system is applied. If the teaching of Sznopek and Sundqvist were combined for some reason, one would be taught to stretch a rubber liner over a mandrel and then apply a polyester hardener system in a helical spiral as the mandrel

was rotated. This would in no way arrive at Applicant ' s claimed method of providing an integral gasket within the socket end of a polyethylene pipe which is securely retained within a receiving groove which is integrally formed about the gasket during the manufacturing step.

Finally, while Corbett, Jr. may mention that a variety of plastic pipe materials are used in plastic pipe joining systems, the specific teaching of the patent is the use of an embedded ring which helps to retain the gasket on the forming mandrel used in a traditional Rieber type process. Corbett, Jr. nowhere teaches a solution to the problem of using polyethylene in the Rieber process or of accommodating its memory characteristics during the manufacture. Thus, not even the combination of Corbett, Jr. would arrive at Applicant's presently claimed invention.

Based upon the above remarks, Claims 4, 5 and 7-11 are thought to be allowable over the art of record and an early notification of the same would be appreciated.

Respectfully submitted,

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Amended Claims With Underlining and Brackets:

4. (Twice amended) A method of installing an integral sealing gasket within a gasket receiving groove located in a [manufacturing an integrated] bell connection [for] of a joint of polyethylene pipe, the method comprising the steps of:

providing a rotatably driven mandrel having a substantially cylindrical end section corresponding to the internal diameter of a bell connection to be formed, the mandrel having an outer extent and an inner extent, the mandrel having a locating area for an elastomeric gasket on an external surface thereof;

positioning an elastomeric gasket on the external surface of the mandrel at the locating area thereof, the locating area being between the inner and outer extents of the mandrel;

forming a bell connection about the mandrel and suitably located gasket by extruding a melt profile made of polyethylene onto the mandrel beginning adjacent the inner extent of the mandrel and spirally winding the melt profile around the cylindrical end section of the mandrel and around the gasket such that adjacent windings of the melt profile make contact;

cooling the bell connection thus formed;

removing the bell connection and gasket from the [mandre] mandrel;

whereby a pre-stressed and pre-located integral gasket is provided within the bell connection [socket end of a polyethylene pipe] which is securely retained within [a] the gasket receiving groove [which is] , the bell connection being integrally formed about the gasket during [the manufacturing step] manufacture.

5. (Twice amended) A method of installing an integral sealing gasket within a gasket receiving groove located in a [manufacturing an integral gasket and] bell connection [for] of a joint of polyethylene pipe, the method comprising the steps of:

providing a rotatably driven mandrel having a substantially cylindrical end section corresponding to the internal diameter of a bell connection to be formed, the mandrel having an outer extent and

an inner extent, the mandrel having a locating area for an elastomeric gasket on an external surface thereof;

positioning an elastomeric gasket on the external surface of the mandrel at the locating area thereof, the locating area being between the inner and outer extents of the mandrel;

forming a bell connection about the mandrel and suitably located gasket by extruding a melt profile made of polyethylene onto the mandrel beginning adjacent the inner extent of the mandrel and spirally winding the melt profile around the cylindrical end section of the mandrel and around the gasket such that adjacent windings of the melt profile make contact;

terminating the extruding step while continuing to rotate the mandrel;

spraying cooling water over the bell end connection thus formed;

cutting a free end of the connection with a rotating knife;and

removing the bell end connection and integral gasket from the mandrel;

whereby a pre-stressed and pre-located integral gasket is provided within the bell connection [socket end of a bell connection of a joint of polyethylene pipe] which is securely retained within [a] the gasket receiving groove [which is] , the bell connection being integrally formed about the gasket during [the manufacturing step] manufacture.

7. The method of claim 5, wherein the mandrel is heated to at least about 100 degrees C. before the melt profile is extruded.

8. The method of claim 5, further comprising the step of subjecting the extruded melt profile to a weak mechanical loading by means of a rotating roll for intensifying a welding-together of the contacting melt profile windings.

9. (Once amended) The method of claim 5, wherein the rotating knife comprises a freely rotating circular blade which is pressed against the polyethylene of the bell end connection for cutting the free end of the connection.

10. The method of claim 5, further comprising the steps of:

removing the bell connection from the mandrel by blowing pressurized air between the mandrel and the connection while directly pushing the connection in a direction opposite the mandrel.

11. The method of claim 10, further comprising the step of:

electrowelding the thus formed bell connection onto a generally cylindrical length of thermoplastic pipe.